

Control of Pine Root Weevils of the Genus Hylobius
in Wisconsin Christmas Tree Plantations

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Three species of root weevils are frequent pests in Wisconsin Christmas tree plantations. Greatest damage occurs in Scotch pine plantations during the period from five years after planting until harvest is completed. The three species are: The pine root collar weevil, Hylobius radicis; the pine root weevil, Hylobius rhizophagus; and the pales weevil, Hylobius pales.

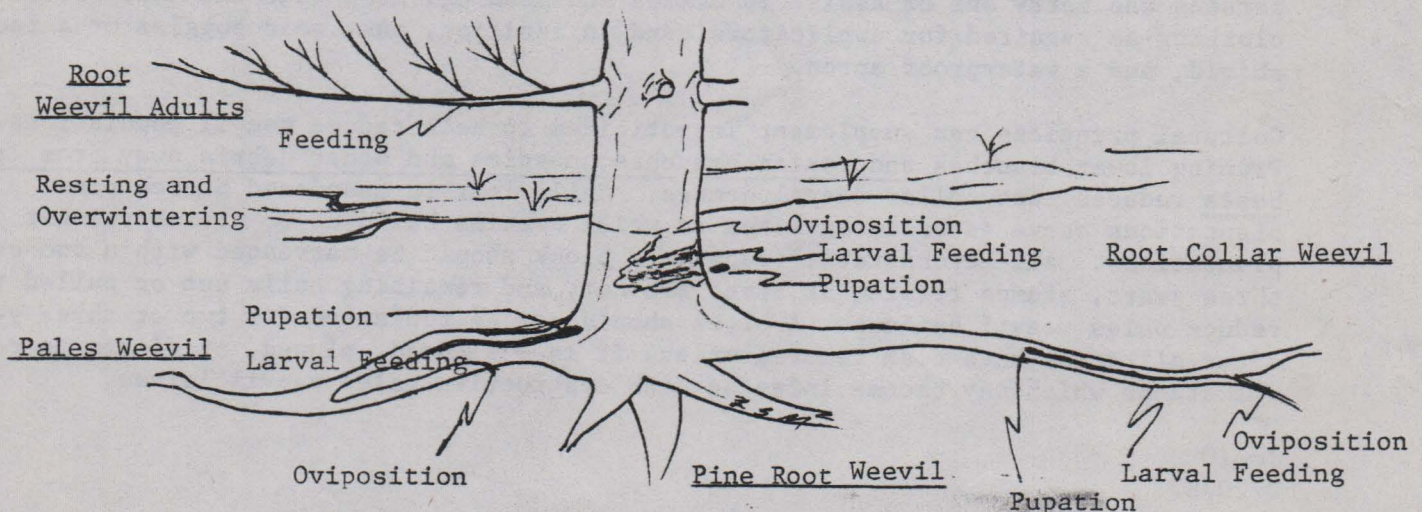
These three species are very similar in appearance as both larvae and adults. Entomologists familiar with this group of weevils can distinguish one species from another with a microscope. Life histories of the three are similar. New adults generally emerge in late summer, feed on the bark of twigs, and overwinter in the duff beneath host trees. The overwintered adults climb trees in the spring, feed on bark again, mate and deposit eggs. Adult weevils are most active at night; daylight hours are spent on the ground beneath trees.

Most egg laying occurs during May and June in sites which differ between the species. The root collar weevil lays eggs in bark crevices very close to ground level. Pales weevil eggs may be laid on exposed portions of stumps, but are also found well below ground level in roots. The pine root weevil, also called root tip weevil, apparently oviposits on small rootlets.

Larval feeding habits provide useful clues for field identification. Root collar weevil larvae feed in the inner bark and stay in the root collar zone which extends from ground level to the buttress root area. They feed through parts of two summers, pupating and emerging as adults 15 to 18 months after eggs were laid.

Pales weevil larvae feed in the stump and outward along the roots, and usually return to pupate near the stump. The pales weevil usually completes development in one season--from egg, to larvae, to pupae, to adult, between May 1 and September 30.

Pine root weevil larvae start feeding on small rootlets (1/8" diam.) and feed progressively toward the stump. Smaller roots may be consumed entirely except for a shell of outer bark, while on larger roots inner bark and wood are consumed leaving a groove along one side of the root. The root tip weevil has a two-year cycle similar to that of the root collar weevil.



ROOT WEEVIL FEEDING PATTERNS ON PINE

The adults of all three weevils spend much time in the duff and soil beneath host trees. Properly timed chemical control destroys these adults while they are in the duff layer. Treatment may be made any time from early spring to fall, preferably during April, May, or early June to destroy overwintered adults before they lay eggs. The chemical remains effective through August and September when the next generation of adults emerges. Early fall treatments destroy adults emerging that fall, and enough insecticide remains to kill adult weevils emerging the next year. Some tree loss may be expected to continue through the year following treatment until all larvae in the trees at time of chemical application have completed their life cycle.

Lindane sprays have been successful for this treatment in Wisconsin. The spray is prepared by adding one quart of emulsifiable Lindane to 100 gallons of water, or for smaller amounts, use one cup in 25 gallons, or three tablespoons in five gallons.

Approximately one cup of dilute spray must be poured or sprayed in an 8-inch band completely around the root collar of each tree that is over two inches in diameter at the ground line. Trees four inches or more in diameter should receive one pint of spray. One gallon of concentrate will make 400 gallons of spray, enough to treat about 4,800 trees.

Hand equipment has been used to carry and dispense the insecticide in small plantations, but only 16 trees are treated per gallon of spray. Most Christmas tree plantations have access roads where power sprayers with long hose lines and hand guns can reach all trees. High clearance sprayers with short hose lines and hand guns can be used to treat several rows as they move through plantations. Mist blowers can not be used for this treatment.

Use of Lindane on Christmas tree plantations in Wisconsin is legal only with an Emergency Use Permit. Write to the Wisconsin Department of Agriculture, Trade and Consumer Protection, 801 W. Badger Road, P.O. Box 8911, Madison, WI 53708, for current regulations and permit requirements before purchasing or using Lindane in Christmas tree plantations.

Persons using or supervising the use of Lindane must be currently certified as private applicators if using the pesticide on land they own or rent; they must otherwise be certified in forest pest control (category 2) as commercial applicators.

Applicators must wear the following protective clothing during the application process: A lightweight protective suit or coveralls; water-resistant hat; unlined waterproof gloves; and unlined lightweight boots. Mixers and loaders, including all persons who carry out or assist in mixing and loading, must wear the same protective clothing as required for applicators, and in addition, must wear goggles or a face shield, and a waterproof apron.

Cultural practices can supplement insecticides to help reduce weevil populations. Pruning lower branches and raking branches, needles and other debris away from tree bases reduces root collar weevil damage. Culls left in abandoned Scotch pine plantations serve as breeding sites in which weevils build up to attack younger plantations. All merchantable trees in a block should be harvested within two or three years, stumps treated as trees are cut, and remaining culls cut or pulled to reduce pales weevil buildup. A block should not be replanted for two or three years after all trees have been removed unless it is bulldozed, plowed, or disked to remove all stumps which may become infested with destructive pales weevil larvae.